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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/534,431

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23505

7590

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EXAMINER

JACKSON JR, JEROME

ART UNIT

PAPER NUMBER

2815

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/534,431	Applicant(s) BARRON ET AL.	
	Examiner Jerome Jackson Jr.	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the described features such as source, drain, gate, and other regions are not adequately shown in sole figure 1. Applicant should submit the provisional application figure as a new drawing to avoid new matter. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-36 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gabriel 2003/0134433.

Gabriel discloses a dielectric coating 11 over a nanotube for protection. The coating does not exist on the nanotube where there is a functional member 12/20 attached to the nanotube by covalent bonding [0040]. In figure 4 there are source 32a and drain 32b electrodes attached to nanotube 10 at regions defined as "source" and "drain". Note also insulation 21 "coats" s/d regions of the nanotube. The "gate" of the device can be defined as the substrate 13, or the region of the nanotube 10 attached to the functional member 12; or the "gate" can be an additional nanotube functionalized and passivated as described in paragraph [0061]. Accordingly, claim 1 is anticipated or at least obvious over Gabriel depending on one's interpretation of "gate", "source", "drain", "exposed", etc.

Claims 2 and 4 are rejected as the nanotube can be single walled [0028] and the dielectric 11 "coats" the source or drain regions.

Claim 3 is rejected as 21 can be silicon dioxide or at least it would have been obvious to practice silicon dioxide as paragraph [0044] discloses silicon dioxide as ordinary insulation in these devices.

Claims 5-8 are rejected because the Gabriel device is a biological agent field effect transistor or "biochem-FET".

Claims 9 is rejected as the device of figures 3 and 4 of Gabriel show a field effect device with a nanotube "on" a gate. The nanotube and gate are coated with a dielectric 11; and, the functionalized region of the nanotube is "etched" in that a functionalized region of the nanotube is attached to a functional structure at an "exposed" portion of the nanotube.

Claim 10 is rejected as the Gabriel device is a “biochem-FET”.

Claims 11 and 12 are rejected as the nanotube is “grown” and “on” or “attached” to the gate.

Claim 13 is rejected as the dielectric layer 11 of Gabriel can be liquid phase deposited [0014] as lipids, surfactants, polymers, and protective coatings are routinely applied to structures in liquid form.

Claim 14 is rejected as the “source” and “drain” nanotube regions of Gabriel are “coated” with coating 11 or insulation 12.

Claim 15 is rejected as 21 is a “passivation” or “insulation” layer on a substrate of silicon and silicon dioxide is disclosed as insulation material [0044].

Claim 16 is rejected as it would have been obvious to have etched insulation 21 with HF as such etchant is well known and routine in the art for etching silicon dioxide.

Claims 17 and 18 are rejected as the functional group 12 of Gabriel is also processed with “chemical functionalization” and because the same molecules (DNA, glycoproteins, etc) are practiced in Gabriel, hydroxylation would have been obvious process for “functionalization” in Gabriel. There are no novel functionalization, etching, or other routine process methods disclosed by applicant as applicant has stated the processes are known in the art and routine for forming the device.

Claims 19-23 are rejected as Gabriel discloses a process of attaching an “indicator” molecule 22, 24, etc. to the nanotube, and the indicator molecules can be DNA, proteins, peptides, etc [0042].

Claims 24-36 are rejected as above, a plurality of sensor devices being anticipated or at least completely obvious.

Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gabriel in view of Bradley 2004/0043527, Clawson WO 00/51186, and Lieber 7,129,554.

Gabriel discloses polymer as the preferred protection layer for nanotubes. Nonetheless, others such as Bradley, Clawson and Lieber disclose oxide based insulators for nanotubes to protect, passivate, or function as barriers. See Bradley [0090-0091]. See Lieber column 5 and the figures. See Clawson where 153 is silicon dioxide, and claim 2 also discloses SiO₂ barrier. It would have been obvious to have practiced silicon oxide barrier material in a structure as Gabriel in place of polymer because oxide material as insulator or "protection" material was already shown at 21 in Gabriel, and prior art nanotube structures also practiced oxide barriers rather than polymer material. While the oxide barrier material may not have been preferred over polymer in Gabriel, it nonetheless would have been obvious substitution to one of ordinary skill in the absence of unexpected results.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerome Jackson Jr. whose telephone number is 571-272-1730. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerome Jackson Jr./
Primary Examiner, Art Unit 2815